

REF 90308

State of California  
The Resources Agency  
DEPARTMENT OF FISH AND GAME

ANNUAL REPORT  
MERCED RIVER FISH FACILITY ANNUAL REPORT  
1977-78

by

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Region 4 Inland Fisheries

Anadromous Fisheries Branch  
Administrative Report No. 82-31

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ABSTRACT

This report summarizes the operation of the Merced River Fish Facility from 1 July 1977 to 30 June 1978. The facility was constructed to rehabilitate the fall run chinook salmon, Oncorhynchus tshawytscha, resource in the Merced River.

In the fall of 1977, 380 adult chinook salmon (260 females and 120 males) were trapped and transported from the San Joaquin River, near Tracy, and released into the Merced River spawning channel. Additionally, an unknown number of fish migrated up the Merced River both before and after the trapping operation. The 1976 BY (75,000) fish scheduled for fall releases were released early (June 1977) as advanced fingerlings.

## INTRODUCTION

The Merced River Fish Facility is located immediately downstream from the Crocker-Huffman Dam on the Merced River (a tributary to the San Joaquin River) about 15 miles northeast of Merced. It is the terminal point for salmon migrating up the Merced River.

The facility was built by the Merced Irrigation District (MID) with Davis-Grunsky Act funds. Operations began in the fall of 1970.

The facility is comprised of a 4,372-ft spawning channel (the Reuben E. Schmidt Spawning Channel), three 275 x 30-ft rearing ponds and one 275 x 30-ft effluent basin (settling pond). Each rearing pond has the capacity for approximately 150,000 chinook salmon yearlings.

The installation is operated by the California Department of Fish and Game, with operating assistance and partial funding of maintenance costs provided by the MID.

## SPAWNING CHANNEL PROGRAM

### 1977-78 Season

On 1 November 1977, the flow in the channel was increased to 4.6 m<sup>3</sup>/sec (165 cfs) and operated at this level for the duration of the spawning period.

As a result of a drought and low flows in the San Joaquin River drainage, an adult salmon trap was operated on the San Joaquin River near Tracy. The trap was installed on 1 November 1977 and operated until 15 December 1977. Upstream migration beyond the trap was limited to a small number of escapees and a few fish that migrated just prior to the installation of the trap. After the trap was removed, an unknown number of late migrants entered the river system.

A total of 380 (260 females and 120 males) green adult chinook salmon was trapped, transported to the Merced River Spawning Channel, and released. An unknown number of the transported fish backed out of the channel and probably spawned in the river downstream from the channel. No immediate losses were observed while transporting the adult fish (approximately 1.5h driving time) but 30 carcasses recovered in the channel revealed the possibility of some delayed mortality. These 30 chinook salmon, all females, had not attempted to spawn. All of the fish trapped and transported were marked with a hog ring (left jaw). A few days after trapping was discontinued, adult salmon began arriving at the channel. An estimated 100 adults arrived at the channel in late December 1977.

### Carcass Recovery and Redd Count

Heavy rains and muddy water conditions hampered observation of spawning activity, redd counts, and carcass recoveries. A total of 44 male and 118 female carcasses was recovered from the spawning channel. Thirty-five adults (carcasses) had no hog ring tags. We estimate that 68 males and 182 females entered the spawning channel.

### Egg Deposition

An estimated total of 200 redds was constructed in the channel during the 1977 season. Egg deposition in the channel was estimated at 1,004,000. This was based on findings from the Stanislaus River where the fecundity of females averaged 5,020 (Moccasin Creek Hatchery files). The last spawning activity in the channel was observed on 13 January 1978.

### REARING PONDS

#### 1976 Broodyear

In 1976, two trapping stations had been used to capture wild juvenile chinook salmon from the Merced River for rearing to yearling size. One fyke net was operated at the mouth of the spawning channel, while a second was operated 10 miles downstream. All of the trapped fish were transported directly to Merced River Fish Facility where they were temporarily held in 14-ft circular tank in order to accustom them to hand feeding. A total of 126,000 chinook salmon fry was trapped at these two sites; 40,000 from the spawning channel and 86,000 from the downstream site.

Due to the drought conditions and rapidly warming water temperatures, the 1976 BY chinook salmon were released into the Merced River on 24 June 1977 as advanced fingerlings (75,000).

#### 1977 Broodyear

A 2-yr drought and drastically reduced flows in the San Joaquin River system restricted normal migration and spawning activity. A salmon trap was fished using pumped water, in the San Joaquin River, just upstream from the Banta-Carbona Irrigation District diversion, near Tracy. The trap was operated from 1 November 1977 until 15 December 1977. During this period, sexually mature fish were spawned; green fish were trucked to the Merced River Spawning Channel and released. While the trap was in operation, over 1,000,000 eggs were taken and shipped to Silverado Field Operations Base in Region 3 where they were incubated and hatched. Mortalities after hatching and during shipments were high.

In February and March of 1978, 388,204 young salmon were received from Region 3 and placed in the rearing ponds. In June 1978, an estimated 100,000 of these fish escaped through a broken pond screen into the Merced River. At the time of escape, flows in the Merced River allowed an easy migration downstream.

An attempt was made to trap wild downstream migrants in the Merced River during March 1978, but high, hazardous flows in the river caused an early termination of the effort. Two trapping locations were used as in the past 2 yr. One trap was operated at the mouth of the spawning channel while a second was operated 10 miles downstream. Between 3 March and 10 March 1978, 1,275 fry were trapped at these two locations (1,075 downstream and 200 in the channel). Trapping was discontinued for the season on 10 March 1978.

### Disease

The second half of 1977 was accompanied by extremely low flows and warm water temperatures. Warm water bacterial outbreaks (Columnaris and gill bacteria) occurred but disease related mortalities in the coho salmon were light. Heavy losses occurred in the coho salmon during the late summer months due to low D.O. levels in the ponds. Mid-pond aerators were used, but continued hot weather and reduced flows upstream necessitated early evacuation of the remaining fish from the facility in September 1977.

### Coho Salmon Program

In May 1977, 158,997 coho salmon fingerlings originally intended for a southern California anadromous program were delivered to the facility and reared until September 1977. Extermely low flows and D.O.'s made it necessary to transfer the remaining coho salmon (59,078) to San Joaquin Fish Hatchery where they were reared for release into Mammoth Pool, Madera County, as part of an inland fisheries program.

### Water Temperature

Water temperatures at the facility were recorded twice daily (early AM and late PM) with a pocket thermometer at the upstream end of rearing pond #1. Monthly water temperatures (C<sup>0</sup>) were:

<u>MONTH (1977)</u>	<u>MAX.</u>	<u>MIN.</u>	<u>MONTH (1978)</u>	<u>MAX.</u>	<u>MIN.</u>
July	21.7	16.1	January	13.3	10.0
August	25.0	18.3	Feburary	15.0	10.0
September	27.2	22.8	March	16.1	10.6
October	*	*	April	13.9	10.0
November	16.7	12.2	May	15.0	11.7
December	14.4	11.1	June	15.6	12.8

\*Facility not in operation